

Water Management

Boaters, lakeside home-owners, commercial marinas, and many others in the Seattle area rely upon the Corps of Engineers' freshwater and saltwater management methods.

Freshwater

Freshwater management involves maintaining Lake Union, Lake Washington, and the Ship Canal at the congressionally authorized level, which typically only varies 2 feet annually. Readings taken at the Locks assist the Lockmaster in regulating the water level and in determining when or if water should be released through the spillway dam.

Saltwater

If saltwater were allowed to flow into Salmon Bay, the salt could eventually turn the lakes into a saltwater reservoir and damage the freshwater ecosystem. Saltwater is denser than freshwater because it contains many minerals, that's why it's easier to float in saltwater. Managing saltwater at the Locks depends on denser water sinking and remaining below freshwater. They do eventually mix, but where freshwater rivers meet incoming saltwater, as in an estuary, a wedge of heavier saltwater pushes under the lighter freshwater. The location of the wedge's tip depends on the force behind the freshwater and behind the saltwater. At high tide, the force behind the saltwater is greater so the wedge

will intrude further. During dry summer months, the wedge can intrude further due to decreased rainfall and an increase in the number of lockages. The Corps constantly monitors salinity levels at various points along the Ship Canal. When salinity levels get too high, the saltwater is flushed from the lock chamber on upstream lockages. This process is called mini-flushing.

Keeping Saltwater out of Lakes Union and Washington

Linking freshwater Lake Washington and Lake Union with saltwater Puget Sound created the potential for saltwater to enter Lake Union, a process called saltwater intrusion. Saltwater intruding into the lake would destroy its freshwater ecosystem. To prevent intrusion of the saltwater, a basin was dredged just above the large lock. The heavier saltwater settles into the basin and drains through a discharge pipe to the downstream side of the spillway dam to return to Shilshole Bay. You can see the outlet of this pipe at the dam near the small lock. **Saltwater Barrier** In 1966, the Corps improved this system by adding a saltwater barrier just downstream of the basin. The 20-foot-tall hinged, hollow barrier is filled with air to keep it upright. It is flooded to make it sink when deep draft vessels pass through.

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